

Typical Properties of Wrought Stainless Steels

To convert to metric: 1000 psi = approx. 6.9 MPa.
C° = (F-32) ÷ 1.8
1 Ft.-Lb. = approx. 1.4 joules

AISI Type	Typical Composition, % (a) Max. (if not designated otherwise)	Form (b)	Mechanical Properties of Annealed Material at Room Temperature				Izod Impact Strength FT-LB	Mechanical Properties at Elevated Temperatures						Thermal Treatment				
			Tensile Strength 1000 Psi	Yield Strength 0.2% Offset 1000 Psi	Elongation in 2 in., %	Hardness		Creep Strength				Scaling Temperature		Initial Forging Temperature, F	Annealing Temperature, F (d)	Stress-Relief Annealing Temperature, F	Melting Range, F	
								Load for 1 % Elongation in 10,000 Hr, 1000 Psi				Max Continuous Service in Air, F	Max Intermittent Service in Air, F					
								1000 F	1100 F	1200 F	1300 F							1500 F
Austenitic (c)																		
201	16-18 Cr, 3.5-5.5 Ni, 0.15 C, 5.5-7.5 Mn, 1.0 Si, 0.060 P, 0.030 S, 0.25 N	Sheets Strips Tubing	115	55	55	Rb 90	110-120	—	—	—	—	1550	1450	2100-2250	1850-2050	—	—	
			115	55	55	Rb 90		—	—	—	—	—	—	—	—			
301	16-18 Cr, 6-8 Ni, 0.15 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S	Plates Sheets Strips Tubing	105	40	55	Bhn 165	100	19	12.5	8	4.5	1.8	1650	1500	2100-2300	400-750	2250-2590	
			110	40	60	Rb 85		—	—	—	—	—	—	—	—	—		
302	17-19 Cr, 8-10 Ni, 0.15 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S	Bars Plates Sheets Strips Tubing Wire	85	35	60	Bhn 150	110	20	12.5	7.5	4.3	1.5	1650	1500	2100-2300	400-750	2550-2590	
			90	35	60	Rb 80		—	—	—	—	—	—	—	—	—	—	
303	17-19 Cr, 8-10 Ni, 0.15 C, 2.0 Mn, 1.0 Si, 0.20 P, 0.15 S min, 0.60 Mo (optional)	Bars Tubing Wire	90	35	50	Bhn 160	85	16.5	11.5	6.5	3.5	0.7	1650	1400	2100-2350	1850-2050	400-750	2550-2590
			80	38	53	Rb 76		—	—	—	—	—	—	—	—	—	—	
304	18-20 Cr, 8-10.50 Ni, 0.08 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S	Bars Plates Sheets Strips Tubing Wire	85	35	60	Bhn 149	110	20	12	7.5	4	1.5	1650	1550	2100-2300	1850-2050	400-750	2550-2650
			82	35	60	Bhn 149		—	—	—	—	—	—	—	—	—	—	—
304L	18-20 Cr, 8-12 Ni, 0.03 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S	Plates Sheets Strips Tubing	79	33	60	Bhn 143	110	19	12.5	8	4.5	2	1650	—	2100-2300	1850-2050	—	2550-2650
			81	39	55	Rb 79		—	—	—	—	—	—	—	—	—	—	—
305	17-19 Cr, 10.50-13 Ni, 0.12 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S	Plates Sheets Strips Tubing Wire	85	35	55	—	110	19	12.5	8	4.5	2	1650	—	2100-2300	1850-2050	—	2550-2650
			85	38	50	Rb 80		—	—	—	—	—	—	—	—	—	—	—
308	19-21 Cr, 10-12 Ni, 0.08 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S	Bars Plates Sheets Strips Tubing Wire	85	30	55	Rb 80	110	—	—	—	—	—	1700	1550	2100-2300	1850-2050	—	2550-2590
			85	30	55	Bhn 150		—	—	—	—	—	—	—	—	—	—	—

309	22-24 Cr, 12-15 Ni, 0.08 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S	Bars Plates Sheets Strips Tubing Wire	95	40	45	Rb 83 Bhn 170	110	16.5	12.5	10	6	3	1950	1850	2050-2250	1900-2050	—	2550-2650
			95	40	45	Rb 85 Bhn 170												
309S	22-24 Cr, 12-15 Ni, 0.08 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S		90	45	45	Rb 85												
310	24-26 Cr, 19-22 Ni, 0.25 C, 2.0 Mn, 1.5 Si, 0.045 P, 0.030 S	Bars Plates Sheets Strips Tubing Wire	95	45	50	Rb 89	110	33	23	15	10	3	2050	1900	2000-2250	1900-2100	400-750	2550-2650
			95	45	50	Bhn 170												
310S	24-26 Cr, 19-22 Ni, 0.08 C, 2.0 Mn, 1.5 Si, 0.045 P, 0.030 S		95	45	45	Rb 85												
316	16-18 Cr, 10-14 Ni, 0.08 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S, 2.0-3.0 Mo	Bars Plates Sheets Strips Tubing Wire	80	30	60	Rb 78	110	25	17.4	11.6	7.5	2.4	1650	1550	2100-2300	1850-2050	400-750	2500-2550
			82	36	55	Bhn 149												
316L	16-18 Cr, 10-14 Ni, 0.03 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S, 2.0-3.0 Mo		81	34	55	Bhn 146												
321	17-19 Cr, 9-12 Ni, 0.08 C, 2.0 Mn, 1.0 Si, 0.045 P, 0.030 S (Ti, 5×C min)	Bars Plates Sheets Strips Tubing Wire	85	35	55	Bhn 150	110	18	17	9	5	1.5	1650	1550	2100-2300	1750-2050	400-750(e)	2550-2600
			85	30	55	Bhn 160												
Ferritic (c)	16-18 Cr, 0.12 C, 1.0 Mn, 1.0 Si, 0.040 P, 0.030 S	Bars Plates Sheets Strips Tubing Wire	75	45	30	Bhn 155	35	8.5	4.7	2.6	1.4	—	1550	1650	1900-2050	Low anneal 1400-1500	—	2600-2750
			75	40	30	Bhn 160												
430F	16-18 Cr, 0.12 C, 1.25 Mn, 1.0 Si, 0.060 P, 0.15 S min, 0.60 Mo (optional)		75	50	25	Rb 85												
430FSe	16-18 Cr, 0.12 C, 1.25 Mn, 1.0 Si, 0.060 P, 0.060 S, 0.15 Se min		75	50	25	Rb 85												
Martensitic (c)	11.5-13.5 Cr, 0.15 C, 1.0 Mn, 1.0 Si, 0.040 P, 0.030 S	Bars Plates Sheets Strips Tubing Wire	80	55	25	Bhn 170	85	11.5	4.6	1.9	1.3	—	1500	1600	1950-2100	Low anneal 1250-1400	—	2600-2750
			80	55	25	Bhn 170												
410	11.5-13.5 Cr, 0.15 C, 1.0 Mn, 1.0 Si, 0.040 P, 0.030 S		75	40	35	Rb 82												
410	11.5-13.5 Cr, 0.15 C, 1.0 Mn, 1.0 Si, 0.040 P, 0.030 S	Bars Plates Sheets Strips Tubing Wire	75	40	35	Rb 82	85	11.5	4.3	2	1.5	—	1300	1450	2000-2200(f)	1500-1650(g) 1200-1400(h)	H1700-1850(d) T 400-1400(i)	2700-2790
			70	35	30	Bhn 150												

(a) Single values are maximums, except as noted; (b) Forms listed are only those for which mechanical properties are given. Most types are available in many forms; (c) Austenitic, hardenable by cold working; not hardenable by heat treatment. Ferritic, not hardenable by heat treatment or cold working. Martensitic, hardenable by heat treatment; (d) Followed by rapid cooling. H is hardening temperature; T is tempering; (e) Stabilizing temperature, 1550 to 1650 F; (f) Retarded cool; (g) Full anneal, followed by slow cooling; (h) Low anneal; (i) Tempering within the range of 800 to 1100 F is not recommended because of resulting low and erratic impact properties and reduced corrosion resistance. Time at temperature and temperatures may vary depending on part size; (j) Retarded cool and anneal.

*Composition for Type 310 tubing varies slightly from AISI values.
†Soft temper.
For standard compositions, refer to ASTM A213.